

**Annex 1: summary of the PBS, restricted to level 1 and 2 (deeper details are available on request).**

**ET interferometers**

- Suspensions: the mirrors must be suspended for vibration isolation purpose.
  - Suspension chain
  - Test-mass suspension
  - Seismic isolation platform
  - Payload (Cryogenic for LF)
  - Other large optics payloads
  - Auxiliary suspensions
  - Production and assembling Tools for the TM suspension
  - Front end analog and digital electronics
  - Cabling
  - Modeling and Simulations
  
- Optics: optical elements (including mirrors) must reach a figure accuracy and roughness at the limit of polishing capabilities; laser stability and beam purity are essential.
  - Core Optics
  - Lasers
  - Input and Output Optics
  - Quantum noise reduction
  - Wavefront sensing and control
  - Scattered Light
  
- Interferometer: the complete optical layout needs his own control and calibration system
  - Observatory Design and Noise Budget
  - Optical Layout Sensing and Control Scheme
  - Data Acquisition and Real-Time Control
  - Calibration
  - Noise Characterization
  - Modelling and Design Tools
  
- Vacuum & Cryogenics: High Vacuum ( $10^{-10}$  mbar) is needed all along the interferometer piping; cryo temperature is required inside the mirror towers.
  - Tower Vacuum
  - Pipe Arm Vacuum
  - Cryostats and Cryopumps
  - Cryogenic Payload (for LF)
  
- Active Noise Mitigation: in addition to the mirror suspension, active system is required to reach the specified level or noise reduction
  - Newtonian Noise
  - Environmental Sensors
  - Suspensions
  - Magnetic Noise Mitigation
  - Seismic Platform SPI
  - Low-Frequency Control Noise

## **ET infrastructure**

- Underground Civil Engineering
  - Access
  - Boreholes
  - Tunnels
  - Caverns
  
- Underground Technical Infrastructure
  - Electrical Distribution
  - Underground Cooling and Ventilation
  - Underground Access
  - Underground Warning Systems
  - Water Management
  - Underground Transport
  - Scaffolding
  - Infrastructure Sensors
  - Vacuum Infrastructure
  - Cryogenics Infrastructure
  - Cleanroom Equipment
  - Miscellaneous
  
- Surface Civil Engineering
  - Buildings
  - Roads
  - Natural Areas
  - Transport
  - Software
  
- Surface Technical Infrastructure
  - Electrical Distribution
  - Surface Cooling & Ventilation
  - Surface Access
  - Surface Warning Systems
  - Water Management
  - Scaffolding
  - Vacuum Infrastructure
  - Cryogenics Infrastructure
  - Cleanroom Equipment
  - Miscellaneous